Claims

1. A unipolar transversal flux machine, in particular a unipolar transversal flux motor, having a rotor (12), which is non-rotatably supported on a rotor shaft (13) and is comprised of two coaxial ferromagnetic rotor rings (14, 15), which on their outer circumference remote from the rotor shaft (13), are provided with constant tooth spacing, and having a permanent magnet ring (16), which is magnetized in an axially unipolar fashion and is clamped axially between the rotor rings (14, 15), and having a stator (11), which is concentric to the rotor shaft (13) and has U-shaped stator yokes (19) with two yoke legs (191, 192) that are connected to each other by a crosspiece (193), which stator yokes (19) are fixed to a housing (10) with a spacing that corresponds to the tooth spacing, and are disposed so that the one yoke leg (191) is disposed opposite the one rotor ring (14) and the other yoke leg (192) is disposed opposite the other rotor ring (15), each with a radial gap distance, yoke elements (20), each of which is disposed between respective stator yokes (19) arranged one after the other in the rotation direction of the rotor (12), extends axially over the two rotor rings (14, 15), and is disposed opposite them with a radial gap distance, and a stator winding (21), characterized in that the stator winding (21) has two coils (22, 23), each with two coil sides (221, 222 or 231, 232), whose one coil side (221 or 231) extends

coaxial to the rotor shaft (13), respectively over a group of stator yokes (19) and yoke elements (20) arranged in succession in the circumference direction, along the side of the yoke elements (20) remote from the rotor shaft (13), between the yoke legs (191, 192), and that the group spanned by the coil side (221) of the one coil (22) is disposed spatially offset on the stator circumference and electrically offset by 90° in relation to the group spanned by the coil side (231) of the other coil (23).

2. The machine according to claim 1, characterized in that the other coil side (222 or 232) of the two coils (22, 23) extends on the outside of the crosspieces (193) of the stator yokes (19), remote from the rotor shaft (13).

3. The machine according to claim 1 or 2, characterized in that each group has an equal number of stator yokes (19) and yoke elements (20) arranged in succession in the circumference direction.

4. The machine according to one of claims 1 to 3, characterized in that the total number of stator yokes (19) spanned by the one coil sides (221, 231) of the two coils (22, 23) is less than the greatest possible number of stator yokes (19) based on the tooth spacing or yoke spacing.

5. The machine according to one of claims 1 to 4, characterized in that the two coils (22, 23) are supplied with current pulses in a bipolar fashion as a function of the rotation angle (θ) of the rotor (12), and that the current pulses in the coils (22, 23) are phase-shifted in relation to each other, in particular by 90°.

6. The machine according to one of claims 1 to 5, characterized in that the stator yokes (19), the yoke elements (20), and the rotor rings (14, 15) are laminate.

7. The machine according to one of claims 1 to 6, characterized in that the yoke elements (20) are disposed offset from the stator yokes (19), in particular by one half the yoke spacing.

8. The machine according to one of claims 1 to 7, characterized in that the radial gap distance between the stator yokes (19) and the rotor rings (14, 15) on the one hand and the radial gap distance between the yoke elements (20) and the rotor rings (14, 15) on the other are the same size.

9. The machine according to one of claims 1 to 8, characterized in that the free end faces (194) of the yoke legs (191, 192) of the stator yokes (19) have at least the same axial width as the rotor rings (14, 15) and preferably protrude beyond the latter on one or both sides.

10. The machine according to one of claims 1 to 9, characterized in that width of the stator yokes (19) and the width of the yoke elements (20), each measured in the rotation direction, are approximately the same.

11. The machine according to one of claims 1 to 10, characterized in that the ratio of the tooth width (b_{ZR}) of the teeth (18) on the rotor rings (14, 15) to the width (b_{ZS}) of the stator yokes (19) and yoke elements (20), each viewed in the rotation direction, is selected to be greater than 1 and less than 2, preferably less than or equal to 1.5.

12. The machine according to one of claims 1 to 11, characterized in that the yoke elements (20) are U-shaped, each with two short legs (201, 202), which are disposed radially opposite a rotor ring (14, 15), and a crosspiece (203), which connects these legs to each other.

13. The machine according to claim 12, characterized in that the free end faces (204) of the short legs (201, 202) of the yoke elements (20) have at least the same axial width as the rotor rings (14, 15) and preferably protrude beyond them on one or both sides.